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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/022,595	12/13/2001	Thomas Patrick Smyth	GCSD-1156 (51225)	5966
27975	7590	05/06/2005	EXAMINER	
ALLEN, DYER, DOPPELT, MILBRATH & GILCHRIST P.A. 1401 CITRUS CENTER 255 SOUTH ORANGE AVENUE P.O. BOX 3791 ORLANDO, FL 32802-3791			THOMAS, ERIC W	
			ART UNIT	PAPER NUMBER
			2831	

DATE MAILED: 05/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

## Office Action Summary

Application No.

10/022,595

Applicant(s)

SMYTH ET AL.

Examiner

Eric W. Thomas

Art Unit

2831

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 29-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 29-31 and 34-41 is/are rejected.
- 7) ☒ Claim(s) 32 and 33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 29-31, 34-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tormey et al. (US 6,055,151) in view Chu et al. (US 5,996,880)

Tormey et al. disclose a device comprising a low temperature co-fired ceramic (LTCC) substrate (PCB – 18-19); at least one capacitive structure embedded in said LTCC substrate comprising a pair of electrode layers (14-15), an inner dielectric layer (12) between said pair of electrode layers, and at least one outer dielectric layer (16-17) adjacent at least one of said electrode layers and opposite said inner dielectric layer,

said at least one outer dielectric layer having a dielectric constant less than a dielectric constant of said inner dielectric layer.

Tormey et al. disclose the claimed invention except for at least one electronic device mounted on said LTCC substrate (circuit board) and electrically connected to said at least one embedded capacitive structure.

Chu et al. teach that it is well known in the art to connect embedded capacitors (formed within a printed circuit board substrate) to external electronic mounted devices (using vias – see fig. 7).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form multiple external electronic mounted devices on the printed circuit board (substrate) of Tormey et al, wherein said external electronic mounted devices are connected to the capacitor, since such a modification would provide an electrical system having multiple electrical components.

Regarding claim 30, Tormey et al. disclose said at least one outer dielectric layer comprises respective at least one outer dielectric layers adjacent each of said electrode layers and opposite said inner dielectric layer.

Regarding claim 31, Tormey et al. disclose each at least one outer dielectric layer comprises a first outer dielectric layer and a second outer dielectric layer between said first outer dielectric layer and a respective electrode layer.

Regarding claim 34, Tormey et al. disclose the inner dielectric layer has a dielectric constant of greater than about 2000.

Regarding claim 35, Chu et al. teach that it is common in the art to form signal circuit traces (@ 74) adjacent the capacitive element (wherein the capacitor is connected to said circuit traces using at least one via).

Regarding claim 36, Tormey et al. disclose the at least one outer dielectric layer and the inner dielectric layer each comprises less than about 15 % by weight of glass.

Regarding claim 37, Tormey et al. disclose the at least one outer dielectric layer comprises at least one of CaO, MgO, ZrO<sub>2</sub>, BaO, and SiO<sub>2</sub> (see table II).

Regarding claim 38, Tormey et al. disclose the inner dielectric layer comprises BaTiO<sub>3</sub> (see table X).

Regarding claim 39, Tormey et al. disclose the electrode layer comprises Ag.

Regarding claim 40, Tormey et al. disclose the thickness of the inner dielectric is less than about 3 mils.

Regarding claim 41, Chu et al. disclose conductive vias electrically connect electronic devices to the at least one embedded capacitive structure.

Regarding claim 42, Tormey et al. disclose the claimed invention except for the capacitor having a capacitive density of greater than about 1000 pF/mm<sup>2</sup>. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form a capacitor having a capacitive density of greater than about pF/mm<sup>2</sup>, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

***Allowable Subject Matter***

4. Claims 32-33, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach or fairly suggest (taken in combination with the other claimed features) a capacitor having a second outer dielectric layer having a greater dielectric constant than the first outer dielectric layer (claims 32-33).

***Response to Arguments***

6. Applicant's arguments with respect to claims 29 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric W. Thomas whose telephone number is 571-272-1985. The examiner can normally be reached on Monday - Friday 5:30 AM - 2:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ewt

 4/27/05  
ERIC W. THOMAS  
PRIMARY EXAMINER